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Ecotourism Service Attributes: Estimation of Visitors' Preferences Using a Choice Experiment Method

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ABSTRACT

Kenyir Lake is one of the popular ecotourism destinations in Malaysia which offers unique ecotourism services, namely house boat services. This service always sees a high demand from visitors as water transportation is the main method of travel at Kenyir Lake. This paper aims to capture the level of satisfaction of the visitors towards the house boat services. This study employed a choice experiment (CE) method, which asked people to choose between alternatives that are described by their attributes in order to estimate the visitors' preferences for house boat service attributes. The attributes investigated were tourist guide (TG), provision of safety equipment (SAFE), coverage for communication system (COMM), package of activities (ACTV) and extra package price (EPP). The simple conditional logit (CL) model and the simple mixed logit model (MLM) were estimated to identify the preferences of the visitors from various service options of house boat attributes. Tourism industries at Kenyir Lake generate a large financial income from house boat attractions. Therefore, the results from this study present several implications and at the same time can be helpful for the policy makers to plan their management strategy in the future. Moreover, it is important to determine the relevant policies that are appropriate with the current condition and to make sure this service fulfils the visitors' satisfaction.

Keywords: Choice experiment, Kenyir Lake, ecotourism, conditional logit model, mixed logit model, house boat services.

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Any remaining errors or omissions rest solely with the author(s) of this paper.

INTRODUCTION

The natural richness of Malaysia's tropical forests, caves, highlands, mountains, and beautiful islands with an amazing marine ecosystem have made it one of the popular ecotourism destinations for the tourists. Ecotourism in Malaysia is simply nature-based tourism which is a sub-sector of tourism based on loving nature and involves journeys to destinations where the flora, fauna, and cultural legacy are the main attractions. In addition, ecotourism is a form of tourism that emphasizes sustainable development and at the same time increases the standard of living of the communities involved. The state of Terengganu is one of the famous ecotourism destinations in Malaysia, popular for its sprawling sandy beaches and the beauty of the islands that attract domestic and foreign visitors. Tasik Kenyir is a well-known ecotourism site in Terengganu. Kenyir Lake is in fact a man-made lake that is the result of a hydroelectric project in 1985 which is how the lake came to exist. It is enriched by various kinds of natural resources and is home to a variety of wildlife. Further, the house boat services which are the main method of travel on Kenyir Lake have also become one of the many interesting ecotourism attractions for visitors.

A house boat offered at Kenyir Lake is a large boat which is equipped with various facilities that includes beds, a kitchen, bathroom, refrigerator, television room, living room and dining room that are all very comfortable. Each house boat can accommodate 15 up to 20 tourists at one time. At present, tourists can rent a house boat for as low as RM 1,000 per night. House boats were originally operated by the local residents. The operation and management of the services used to be fully under the responsibility of the individual house boat operators. However, the Development Authority of Terengganu Tengah, (KETENGAH) agency under the Ministry of Rural and Regional Department is now the responsible body that issues licenses and monitors the operation.

Recently, the number of tourists that stay in house boats has increased significantly on a yearly basis and this is in line with the increase in tourist arrivals at Kenyir Lake. Table 1 shows the statistics for tourist arrivals and tourist accommodation in house boats at Kenyir Lake from 2003 to 2011. By referring to the table, the number of tourists staying in house boats has increased from 936 tourists in 2003 to 10,353 tourists in 2011. From 2003 until 2011, the statistics of tourist accommodation in house boats show a fluctuation in the number of total tourists. Nevertheless, the growing number of tourists reached more than ten thousand in 2010 and 2011 which indicates that the services have become increasingly popular among visitors. The high demand from tourists to use this service has created a crowded and congested situation of usage of this service. This overwhelming increase in the number of visitors now poses a serious challenge for

the house boat operators and the Kenyir Lake authorities, who must cater for the needs of the tourists whilst ensuring that the house boat services are up to the task.

The purpose of this study is to estimate the ecotourism services level on Kenyir Lake, where the main focus is put on the house boat services. The specific objectives of this study are: (1) To identify the socio-economic profile of the respondents; and (2) To determine the visitors' preferences for the house boat service attributes on Kenyir Lake by using the choice experiment method. The evaluation and assessment of the ecotourism service attributes is important in order to confirm that the service fulfils the requirements and meets the preferences of the visitors.

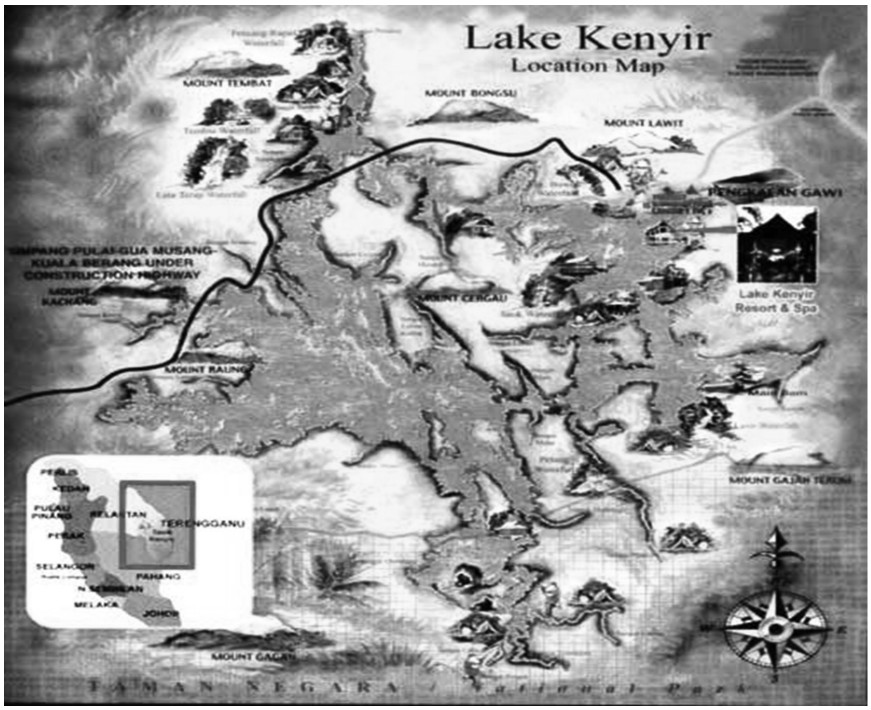
Table 1 Statistics of Tourist Arrivals and Tourist Accommodation in House Boats at Kenyir Lake from Year 2003 to 2011

Year	Tourist Arrivals at Kenyir Lake	Tourists Accommodated in house boats
2003	37,287	936
2004	41,853	2,411
2005	50,815	6,877
2006	60,532	4,126
2007	92,199	6,864
2008	133,569	6,292
2009	189,388	7,681
2010	225,570	10,877
2011	275, 241	10,353

Source: Tourist Arrival Report at Kenyir Lake in 2011(KETENGAH)

KENYIR LAKE

Figure 1 shows the location of Kenyir Lake in Malaysia. Kenyir Lake is located in the Hulu Terengganu district in the state of Terengganu on the East coast of Malaysia. It is a man-made lake built up due to water retention from the Kenyir Hydroelectric Dam that was completed in 1985 and at the time of writing it is the largest man-made lake ever built to generate electricity in Southeast Asia. Since the existence of the Kenyir dam, the surrounding area has become known to the public both inside and outside the country. Tourists that come here have increased the awareness of the town Kuala Berang, located in Hulu Terengganu. This area was previously known as a 'dead town' before it became famous to the tourists. Pengkalan Gawi is the main entrance to Kenyir Lake which offers the services of a Tourist Information Centre, a jetty, a parking area, boats, house boats and a variety of water sport amenities for rental. Chalets and resorts are another ecotourism service provided here with a differing range of prices to suit the budget of every visitor.



Source: Lake Kenyir Location Map (www.fnetravel.com/english/kualaterengganuhotels/lakekenyirresortandspa/lake-kenyir-resort-and-spa-map.jpg.)

Figure 1 Kenyir Lake map

The Development Authority of Terengganu Tengah (KETENGAH) agency under the Ministry of Rural and Regional Department is the main responsible authority that manages Kenyir Lake from the overall aspect including the planning and development of Kenyir Lake, providing infrastructure facilities, approving applications based on tourism programmes and activities in the area of Kenyir Lake and also issuing licenses for boat services. The other authorities that have their own responsibility in the management of Kenyir Lake are Tenaga National Berhad (TNB) which is the responsible body for the management of the hydroelectric dam, the Department of Wildlife and National Parks (PERHILITAN) which is the responsible body for maintaining the National Park, regulating, controlling and preventing any illegal activities, and lastly the Police Marine Unit that patrols the lake and is responsible for taking care of all aspects of security on Kenyir Lake.

Kenyir Lake offers enjoyable experiences and truly unforgettable scenic beauty for the visitors. The features of Kenyir Lake include beautiful waterfalls which provide a cool and relaxing surrounding environment. The legendary caves in the area of Kenyir Lake also offer amazing sights, the hill regions and also the surrounding flora and fauna. The attractions and the interesting activities that can be enjoyed at Kenyir Lake are shown in Table 2 and Table 3.

Table 2 Ecotourism attractions at Kenyir Lake

Attractions	Details of attraction
Waterfalls	• Lasir Waterfall It is located 16 km to the south of Pengkalan Gawi and is among the well-known picnic places at Kenyir Lake. • Saok Waterfall Saok Waterfall is located at the east of Pulau Besar and is a 20 minute boat ride from Gawi Jetty. Saok Waterfall has become popular with the tourists. • Tembat Waterfall This waterfall has a large camping area and it is the most popular destination for campers. The boat ride takes about an hour from Pengkalan Gawi.
Cave	• Bewah Cave This cave is situated in Bewah Hill; hence its name. This cave provides a fantastic view of the towering limestone hills. • Taat Cave This cave contains some fascinating stalactites and stalagmites which come in various forms, shapes and sizes. The wall is lined with amazing white limestone engraved by nature.
Hill regions	The hill regions of Kenyir Lake are a world of untouched virgin tropical jungle estimated to be millions of years old. Mount Chergau is the highest peak while Mount Gagau is the second highest peak in the National Park.
National Park	The water area of Kenyir Lake is a part of the Malaysian National Park. This National Park is combined with the other states of Pahang, Kelantan and Terengganu.

Table 3 Interesting activities at Kenyir Lake

Activities	Details of activities
Fishing	The lake is known as an angler's heaven for freshwater fish. Hundreds of species of fish such as Kelah, Kelisa**,** Baung, Toman, Seberau and Lampam are easily found. Good fishing areas are at Cacing, Leban, Petuang, Saok, Terengganu River and so on.
Camping/Jungle tracking	Popular spots for camping are Pengkalan Gawi, Bewah in the National Park, along the rivers of Saok, Lasir, Tembat and Lawit. For jungle trekking activities, the popular and challenging trails are Mount Gagau and Lawit. A jungle guide is needed for new trekkers.
Water Sports	Kayaking, canoeing, boating, rafting and shooting rapids are among the water sport activities offered at Kenyir Lake. With a sprawling water catchment area of some 38,000 hectares, Kenyir Lake is promoted as a water sport circuit by KETENGAH.
Staying in a house boat	This is a large boat, prepared with basic facilities such as beds, kitchen, bathroom, refrigerator, television, living room and dining room. Most of the house boats on Kenyir Lake offer a set price by the package. Visitors can sleepover in this boat and enjoy taking part in the activities that are offered by the package.

METHODOLOGY

Choice Experiment Method

There are four main alternatives in the choice modelling (CM) technique and one of these is the choice experiment (CE) method that can be used to estimate the value of changes in environmental quality and services that are not revealed in market transactions. From early origins in transport and marketing fields, choice modelling has been developed for applications in the environmental value field. "The technique is versatile, and can be designed for a wide variety of purposes" (Rolfe, 2006). CM is a family of survey-based methodologies for modelling preferences for goods, where the goods are described in terms of their attributes and levels (Hanley *et al*., 2001). In a nutshell, a choice experiment study involves asking the respondents to choose between different bundles of goods that are described in terms of their attributes and levels. A monetary value is included as one of the attributes, along with other attributes of importance when describing the profile of the alternatives presented (Alpizar *et al*., 2001). By making one of these attributes a price or cost term, marginal utility estimates can be converted into willingness-to-pay estimates

for changes in attribute levels, and welfare estimates obtained for combinations of attribute changes (Hanley *et al*., 2006).

The choice experiment technique allows trade-offs between goods in the choice set or attribute profile, as well as monetary compensation (Hanley *et al*., 2001). In this study, for example, house boat operators or the Kenyir Lake authorities can study the number of attributes related to house boat services that the visitors are willing to trade off for one another. Therefore, this valuable information can be used to improve the efficiency of the services. There are two aspects of CE related to theoretical foundations. The CE technique is an application of the Characteristics Theory of Value by Lancaster (1966) combined with the Random Utility Theory by Manski (1977). According to Lancaster (1966), the good per se, do not give utility to the consumer; they possess characteristics, and these characteristics give rise to utility; goods will possess more than one characteristic, and many characteristics will be shared by more than one type of goods and goods in combination may possess characteristics different from separate goods. Meanwhile, the random utility theory (RUT) can help to derive the best estimator of the unknown true utility function and this theory relates utility directly to the probability of choosing a particular alternative from a set of alternatives (Mohd Rusli *et al*., 2008).

This study combined the simple conditional logit model and the simple mixed logit model to estimate the choice modelling exercise. The ML model accounts for preference heterogeneity by allowing utility parameters to vary randomly (and continuously) over individuals (Garrod *et al*., 2012). Meanwhile, the CL framework imposes homogeneous preferences across respondents and its related assumption of the independence of irrelevant alternative (IIA) (Hausman and McFadden, 1984). Preferences on the other hand, may be heterogeneous and by accounting for the existence of heterogeneity this enables computations of unbiased estimates of individual preferences (Garrod *et al*., 2012).

There are two stages in this study. First, the simple CL model was estimated by allowing the basic model for house boat attributes to enter an indirect utility specification. Second, the estimation of simple MLM also allowed the main attributes to enter the indirect utility specification. These two kinds of models are compared by using statistic indicators and the log-likelihood ratio test.

In order to develop a conditional logit model, McFadden (1974), Hanley *et al*., (1998) and Train (2003) were referred to. Using their method, consider the vector of all attributes of alternative j as faced by respondent i as $Z_{ij.}$ The respondent would gain a definite level of utility from each alternative. According to Lancaster (1966), the utility that respondent *i* can obtain from alternative j, denoted U_{ij} can be written as $U_{ij} = U(Z_{ij})$. U is a utility function. The utility that respondents derive

from any options is assumed to depend on the attributes. The respondent chooses the alternative that provides the greatest utility. Alternative *j* will be chosen over some other option *k,* therefore the behavioural model if and only if $U_{ij} > U_{ik,}$; $j \neq k$. Then, we can write; $U(Z_{ij}) > U(Z_{ik})$; $j \neq k$. Thus, the individual utility function (for individual i), where the respondent is facing a set of j alternatives (j= 1…..J) can be written as:

$$U_{ij} = V_{ij} + \varepsilon_{ij}$$

Assume now that the utility function can be partitioned into two parts; one deterministic and in principle observable (denoted as V_{ij}) and one random and unobservable, denoted as ε_{ij} (Hanley *et al*., 1998). In this situation, the ε_{ij} is not known and therefore is treated as a random term. The joint density of the random vectors, $\varepsilon_i = (\varepsilon_{i1,} \varepsilon_{i2}\ldots. \varepsilon_{ij})$ is denoted $f(\varepsilon_i)$. With this density, the researcher can make probabilistic statements about the decision-maker's choice. The probability that respondent *i* choose alternative *j* is (Train, 2003); P_{ij} = Prob $(V_{ij} - V_{ik}) > (\varepsilon_{ij} - \varepsilon_{ik})$; $j \neq k$. This probability is a cumulative distribution, which is the probability that each random term, $\varepsilon_{ij} - \varepsilon_{ik}$ is less than the observed quantity $V_{ij} - V_{ik.}$ Hence, by using the density $f(\varepsilon_i)$ this cumulative probability can be rewritten as; $P_{ij} = \int I(\varepsilon_{ij} - \varepsilon_{ik}) < (V_{ij} - V_{ik}) f(\varepsilon_i) d\varepsilon$.

In order to estimate a random utility model, a distribution of error terms must be specified. If error terms are assumed to be independently and identically distributed (IID), and if this distribution can be assumed to be a Gumbel distribution (the error terms are logistically distributed), the conditional logit model can be developed. Thus, the probability of respondent i choosing alternative j can be formed as:

$$P_{ij} = \frac{\exp(\mu V_{ij})}{\sum_j^i \exp(\mu V_{ik})}$$

The assumption of independent and identically distributed error terms implies the independence of irrelevant attributes (IIA). According to Ghorbani *et al*., (2011), the property of IIA states that the relative probabilities of two options being selected are unaffected by the introduction or removal of other alternatives. The functional form of the respondent systematic component of the utility function, by assuming that V_{ij} is a linear parameter, can be expressed as:

$$V_{ij} = \beta_1 X_{ij} + \beta_2 X_{2ij} + \ldots. \beta_n X_{nij}$$

where X_s are the variables in the utility function and the β_s are coefficients to be estimated. If a single vector of coefficients β_s applies to the whole, associated

utility functions and the scale parameter μ assumed to be equal to 1, μ = 1, then we can rewrite as:

$$P_{ij} = \frac{\exp(\beta V_{ij})}{\sum_{j}^{i} \exp(\beta V_{ik})}$$

Where P_{ij} = Respondent i choice probability of alternative j, X_{ij} and X_{ik} are the vectors describing the attributes of j and k and β is a vectors of coefficients. Then, the next step is to calculate the willingness to pay estimation, which is based on β values. The β values show the effect on utility of changes in the attributes, but for a cost-benefit analysis, the money-metric measure of willingness to pay (WTP) is needed (Hanley and Barbier, 2009). For a marginal change in an attribute, WTP is typically derived by dividing the β value of each non-price attribute by the β value of the price attribute.

$$WTP = \frac{-\beta X1}{\beta C}$$

The indirect utility function, $V_{ij} = \beta_1 X_{ij} + \beta_2 X_{2ij} + \ldots. \beta_n X_{nij}$ is linear and therefore a ratio of any two coefficients provides information about the trade-off or marginal rate of substitution between the corresponding variables. This value for any attributes (other than price attribute) is called the implicit price or marginal rate of substitution (MRS) (Hanley and Barbier, 2009).

Choice Experiment Design

Generally, the main stages in designing a choice experiment (CE) are the selection of attributes, assignment of levels, making a choice of experimental design, construction of choice sets and measuring preferences. In CE questionnaire design, it is important to decide the number of attributes and levels which are related to the study site problem at the first design stage. In this case, the goods to be valued are the house boat service attributes at Kenyir Lake. The types of the attributes are shown in Table 4.

Five house boat service attributes were selected and used in this study. The first attribute is a tourist guide (TG). Two levels were chosen: qualified and unqualified tourist guide. The role of a tourist guide is not only to handle or pilot the boat but also to serve to provide information for the tourists and to give an explanation of the features of Kenyir Lake. The second attribute is safety equipment (SAFE). Two levels were chosen: adequate and inadequate. The safety equipment includes the equipment that should already exist in the house boats, for instance safety jackets, buoys, medicines and others. The third attribute is a communication

Table 4 House boat service attributes at Kenyir Lake

Attributes	Levels	Descriptions
Tourist guide (TG)	*Unqualified (TG1)*	*TG does not have approval in handling the boat*
	Qualified (TG2)	The tourist guide is approved and is trained
Safety equipment (SAFE)	*Inadequate (SAFE1)*	*Safety equipment is insufficient*
	Adequate (SAFE2)	Adequate safety equipment is provided: safety jackets, buoy, and a first aid box.
Communication system (COMM)	*No coverage (COMM1)*	*No coverage in the area of the lake.*
	Coverage exists (COMM2)	There is communication system coverage when visitors are staying in a house boat at the lake.
Package of activities (ACTV)	*Common (ACTV1)*	*Fishing/KelahSanctuary/waterfall/ Bewah cave*
	Premium (ACTV2)	Common + 1 additional activity
	Super (ACTV3)	Common + 2 additional activities
Extra Package Price (EPP)	*No increase*	
	Increase 10%	
	Increase 20%	
	Increase 30%	

Note: Italics represents the status quo or current condition

system (COMM). Two levels were chosen: no coverage and coverage exists. A communication system is the most important facility to ensure connection with people in the outside world.

The fourth attribute is a package of activities (ACTV). Three levels were chosen: common, premium and super. The common activities offered by the house boat operators are visits to the National Park, Bewah Cave, Lasir Waterfall, Kelah Sanctuary and fishing. The premium package activity includes the common package with one additional activity. Meanwhile the super package activity includes the common package with two additional activities. The measurement of the ecotourism service value in this study simply uses the extra package price (EPP) which is the last attributes of the house boat services as a monetary attribute. The lowest price per night for one house boat operator is RM 1,000. Increasing the house boat package price will allow for a better quality of services, increased safety

facilities, employment of a qualified tourist guide, availability of communication system coverage and visitors can also enjoy further additional activities offered in the house boat package. Four levels were chosen: no increase in package price, increase by 10%, increase by 20% and increase by 30%.

DATA COLLECTION

The stated choice experiment survey was conducted at Kenyir Lake from January to March 2012. This study also utilised face to face interviews with a sample population comprising 285 local visitors. The questionnaire design was based on choosing a set of house boat service attributes related to the study problem. The attributes used to describe the alternatives in each choice set had to be relevant to the policy making process and had to have meaning to the people who would be answering the questionnaire (Bennett and Blamey, 2001). Finally, as explained in the previous section, five house boat attributes were selected and used in this study. This study applied a series of multiple choice scenarios. The choice options for the house boat service attributes differed according to the choice sets. Each choice set had three alternatives for the house boat services at Kenyir Lake. Service options one and two are the alternatives; meanwhile, service option three is always the same as the status quo option. The status quo option was provided for respondents who do not want a change in the service options described.

Table 5 shows three service options of a house boat from which the respondents were asked to choose the most desirable option. If, for example, a respondent chose service option 1 in preference to service option 2 that would mean the respondent would be happy to pay a 30% increase instead of a 10% increase in the package price of the house boat services in order to have a qualified tourist guide, adequate

Table 5 Example of a choice experiment question

	Option 1	**Option 2**
Tourist Guide	Qualified	Unqualified
Safety Equipment	Adequate	Inadequate
Communication system	Coverage exist	No coverage
Package of Activity	Common	Premium
Extra Package Price	Increase 30%	Increases 10%
Option	✓	

Or would you prefer NO CHANGE in the current services for the house boat services at Kenyir Lake with Tourist Guide, Safety Equipment in the House boat, Communication System, Package of Activity and Extra Package Price

safety equipment, coverage for a communication system and a common activity package. If the respondent choses service option 2 the respondent would get an unqualified tourist guide, possibly inadequate safety equipment, no coverage for a communication system, a premium activity package, but would only have to pay a 10% increase rather than a 30% increase.

Table 6 presents the theoretical expectation of the explanatory variables. In this study, there are four variables that are expected to have positive signs, namely a qualified tourist guide, adequate safety equipment, coverage for a communication system and additional packages of activity. These variables are expected to have a positive impact on the utility of the respondent. The extra package price variable is expected to have a negative impact on the utility of the respondents because it decreases disposable income for other goods or services during their visit and therefore the expected sign will be negative.

Table 6 The Theoretical Expectations of the Explanatory Variables

Variable	Expected Sign	Explanation
TG	+	A qualified tourist guide can offer a good service and this is expected to have a positive impact on the respondents' utility.
SAFE	+	An increase in safety equipment is expected to have a positive impact on utility.
COMM	+	Visitors can obtain coverage for a communication system while they are staying at the lake. Thus, the expected sign will be positive because their utility will increase.
ACTV	+	An increase in package activity is expected to have a positive impact on utility because respondents can enjoy additional activities, thus gaining knowledge and experience.
EPP	–	An increase in package price is expected to have a negative impact on utility and the WTP of the respondents as it reduces disposable income for other goods during their visit. Thus, the expected sign will be negative.

RESULTS

Socio-economic Profile of the Respondents

Table 7 presents the results of the socio-economic profile of the respondents. There were 285 respondents in the survey. Out of the total number of respondents, 149 (52.3%) were male and 136 (47.7%) were female. The respondents included visitors aged between 19 and over 50 years old. From the table it can be seen that

Table 7 Socio-economic profile of the respondents

	Frequency	Percentage
Gender		
Male	149	52.3
Female	136	47.7
Age		
19-20	21	7.4
21-30	166	58.25
31-40	56	19.65
41-50	34	11.9
> 50	8	2.8
Number in the Household		
1-5	196	68.8
2-10	83	29.1
11-13	6	2.1
Education Level		
Primary School	2	0.7
Secondary School	122	42.8
Pre-University	38	13.3
Diploma	57	20.0
Degree	48	16.8
Master and PhD	18	6.4
Type of Profession		
Professional and Technician	39	13.7
Administration and Management	39	13.7
Sales	28	9.8
Services	50	17.5
Labour	20	7.0
Business	67	23.51
Housewife	42	14.7
NGO member		
Yes	8	2.8
No	277	97.2
Monthly Gross Income Level		
< 1000	89	31.2
1001-2000	107	37.5
2001-3000	48	16.8
3001-4000	18	6.3
> 4001	23	8.2

196 (68.8%) of the respondents have a number in the household of between 1 to 5, followed by between 2-10 (29.1%) and 11-13 (2.1%). The category of education level showed that 42.8 % of the respondents attained secondary education level while diploma, university degree and pre-university formed 20.0 %, 16.8 % and 13.3 % of the sample respectively. The lowest education level was primary school with 0.7 % while the highest education level, namely PhD and Master level showed 6.4 %. From the results it can be seen that the majority of visitors who go to Kenyir Lake have a high level of education.

From the survey, in terms of profession, most of the respondents are businessman (23.51%) followed by service workers (17.54%) and housewives (14.74%) while professional and technician, and administration and management, showed the same percentage (13.7%). Sales workers indicated 9.82 % and the lowest result was for labour at 7.02 %. Another important aspect of the background of the respondents is income level. In terms of income, the majority of visitors (37.5%) earned gross monthly income of between RM 1,001-RM 2,000. This was followed by the income group of less than RM 1,000 (31.2%), followed by groups RM 2,001-RM 3,000 (16.8%), RM 4,001 and above (8.2%) and between RM 3,001-RM 4,000 (6.3%). Normally, respondents who earn a higher income are willing to pay a higher price for extra package.

Choice Experiment Result

The Simple Conditional Logit Model

The econometric function for a simple CL model can be written as follows:

$$U = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

where,

X_1 = TG2 (qualified tourist guide)
X_2 = SAFE2 (adequate safety equipment)
X_3 = COMM2 (the coverage for a communication system exists)
X_4 = ACTV2 (common package + 1 additional activity)
X_5 = ACTV3 (common package + 2 additional activity)
X_6 = EPP (extra package price)

Table 8 presents the estimation results for the simple conditional logit model. The parameters of the model are generally in accordance with *a priori* expectation. The variables TG2, SAFE2, COMM2 and ACTV2 were significant at the 1% level with the correct expected sign. ACTV3 also had the correct expected sign, but it was

not statistically significant. This means that the respondents prefer less activities rather than additional package activities, namely a super package activity. EPP was significant at the 1% level and with an expected negative sign. This indicates that as the package price for the house boast increases, respondents are less likely to contribute because of the decrease in the utility level.

Table 8 Simple conditional Logit Model

Variable	Coefficient	Standard error	t-ratio	P-value	Marginal value (%)
TG2	0.8509	0.1916	4.440***	0.0000	16.3268
SAFE2	1.2291	0.4369	2.813***	0.0049	23.5817
COMM2	0.3516	0.1061	3.312***	0.0009	6.74617
ACTV2	0.9856	0.2625	3.754***	0.0002	18.6962
ACTV3	0.1822	0.2770	0.658	0.5107	3.49614
EPP	-0.0521	0.0191	-2.716***	0.0066	
Number of observations		1425	R-sqrd	0.09590	
Log likelihood function		-1415.382	RsqAdj	0.09400	
Log-L fncn No coefficients		-1565.5225			

Notes: *** Significant at 1 %, ** Significant at 5 %, *Significant at 10 %

The Simple Mixed Logit Model

Table 9 presents the result for the simple MLM for the house boat attributes. In that table, the first part presents the estimated values for the means of preferences for the house boat attributes. The second part in the table presents the estimated standard deviation. From the table, there are three variables that are highly significant (1% level) with *a priori* expectation signs, namely, TG2, ACTV2 and EPP. SAFE2 also shows the positive expectations signs with a 5% significance level.

The two other attributes, namely COMM2 and ACTV3 are not significant and show the wrong expected signs. This means that the existence of the communication system is not really important to the visitors during their vacation on the house boat because they do not want to be disturbed while enjoying their holiday. Furthermore, the respondents prefer less activities rather than additional package activities, namely a super package activity (ACTV3). The standard deviations of the coefficients for this result are not significant at all levels except for COMM2, which is significant at the 1% level. EPP was significant at the 1% level and with an expected negative sign which indicates that as the package price for the house boat services increases, respondents are less likely to contribute because of the decrease in the utility level.

Table 9 Result for the simple Mixed Logit Model

Variable	Mean coefficient	Std. error	t-value	Marginal value (%)
CONOPTION	1.12756	0.1555	7.251	12.59
TG2	1.3268	0.2724	4.870***	14.81
SAFE2	1.4551	0.5759	2.527**	16.24
COMM2	-0.2164	0.1450	-1.492	-2.42
ACTV2	1.2210	0.3397	3.595***	13.63
ACTV3	-0.4699	0.3575	-1.315	-5.25
EPP	-0.8959E-01	0.2587E-01	-3.463***	
Standard deviations of parameter distributions				
TG2	0.8730E-02	0.8477	0.010	
SAFE2	0.4634E-01	0.7079	0.065	
COMM2	1.3468	0.3460	3.892***	
ACTV2	0.4539	0.7006	0.648	
ACTV3	0.9314E-01	0.4352	0.214	
Summary statistics				
Number of Observations	4275			
Log likelihood function	-1375.011			
Pseudo-R^2	0.12169			
Adjusted Pseudo-R^2	0.11798			
Chi Squared (12)	381.0232, *P* value = 0.000			

Notes: 1) *** Significant at 1%, ** Significant at 5%, *Significant at 10%
2) *CONOPTION* is the intercept of the model

Marginal Willingness to Pay

The marginal rate of substitution indicates the WTP of the respondents according to their (truly revealed) preferences (Siebert, 2008). In this section, it should be noted that the marginal values measured are in percentages (%) related to the extra package price at average price of RM1,000. For instance in our study one of the attributes was the tourist guide, so by dividing the β value of this attribute by the β value of price, this would show the average willingness to pay of the respondents to increase the quality of the tourist guide from the current level. The formula for marginal value is given as below:

$$\text{MV} = \frac{-\beta_{\text{attribute}}}{\beta_{\text{monetary value}}}$$

Table 10 shows the marginal value for both the CL simple and the MLM simple models. For example, the marginal value calculated for TG2 from the simple model is 16.32 which indicate that each one unit increase in tourist guide services has a marginal value of 16.32% in the extra package price, or the respondents are willing to pay for a 16.32% increase in the extra package price to increase the tourist guide services from the current level. The marginal value of TG2 for the simple MLM is 14.81, a little bit lower than the CL model.

Table 10 Marginal value for simple CL and ML Models

Variable	Marginal value	
	CL simple	**ML simple**
TG2	16.32	14.81
SAFE2	23.58	16.24
COMM2	6.74	-2.42*
ACTV2	18.69	13.63
ACTV3	3.49	-5.25*

The marginal value for SAFE2 is 23.58 in the simple model. Respondents are willing to pay an increase of 23.58% in the extra package price for adequate safety equipment prepared in the house boat. In the simple MLM, the marginal value for SAFE2 is 16.24, which is lower than the CL model.

The marginal value for COMM2 is 6.74 in the CL simple model and -2.42 in the simple mixed logit model. The negative sign in the simple MLM indicates that the utility has been reduced. This means that each one unit decrease in the coverage for communication system has a marginal value of 2.42% extra package price for the simple MLM. However, the result was not significant in the simple ML model

The marginal value for ACTV2 is 18.69 in the simple CL model and 13.63 in the simple mixed logit model. For the simple CL model, respondents are willing to pay an increase of 18.69% in the extra package price for one additional activity offered in the premium package of activity meanwhile in the ML model respondents are willing to pay an increase of 13.63% in the extra package price. The variable ACTV3 shows a positive marginal value of 3.49 in the simple CL model but indicates a negative value of -5.25 in the simple ML model. However, the result was not significant in the simple ML model.

By ignoring the insignificant results, the highest and the second highest willingness to pay results of the respondents for the CL simple model are SAFE2 and ACTV2, and for the ML simple models the highest and the second highest of willingness to pay results are SAFE2 and TG2. The respondents realize that

adequate safety equipment is important to protect human life and to ensure their safety during a vacation in the house boat. Furthermore, the respondents prefer one additional activity offered in the premium package activity and the provision of qualified tourist guide is very important for them during vacation. As a conclusion, from the marginal value results it can be said that the adequate safety equipment (SAFE2) installed in the house boats, premium package activity (ACTV2) and a qualified tourist guide (TG2) are most preferred by the respondents because they are willing to pay higher prices for these variables in the extra package price.

CONCLUSION

The main objective of this study was to present an empirical analysis of the CE in order to estimate the preferences of the visitors for house boat service attributes at Kenyir Lake. Face-to-face interviews were conducted with 285 respondents and the questionnaire includes the socio-economics profile of the respondents. The simple CL results showed that the variables TG2, SAFE2, COMM2 and ACTV2 were significant at the 1% level with the correct expected sign, thus, implying that the provision of qualified tourist guide services, an adequate safety equipment in house boat, premium package of activities and the availability of communications systems while staying in the house boat are most preferred by the visitors. ACTV3 also had the correct expected sign, but it was not statistically significant which indicates that the respondents prefer less activities rather than additional package activities, namely a super package activity

For the simple ML results, it showed that there were three variables that were highly significant (1% level) with *a priori* expectation signs, namely, TG2, ACTV2 and EPP. The variable SAFE2 also showed positive expectations signs with a 5% significance level. These results imply that the provision of qualified tourist guide services, a premium package of activities offered by the house boat package and adequate safety equipment installed in the house boats are most preferred by the visitors. COMM2 and ACTV3 were not statistically significant and had the wrong expected signs which reveal that the existence of communication system coverage is not really important to the visitors during their vacation on the house boat and they also prefer less activities rather than additional package activities, namely a super package activity (ACTV3).

From the marginal value results for both models, namely the simple CL and simple ML models, it can be said that adequate safety equipment (SAFE2) installed in the house boats, premium package activity (ACTV2) and a qualified tourist guide (TG2) are most preferred by the respondents because they are willing to pay more

for both variables in the extra package price. In order to achieve the satisfaction of the visitors and to maintain the demand for house boat services in the future, this information is very significant and useful for the house boat operators and Kenyir Lake management as a guide to enhance their facilities from the current *status quo* level to a better service provision.

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